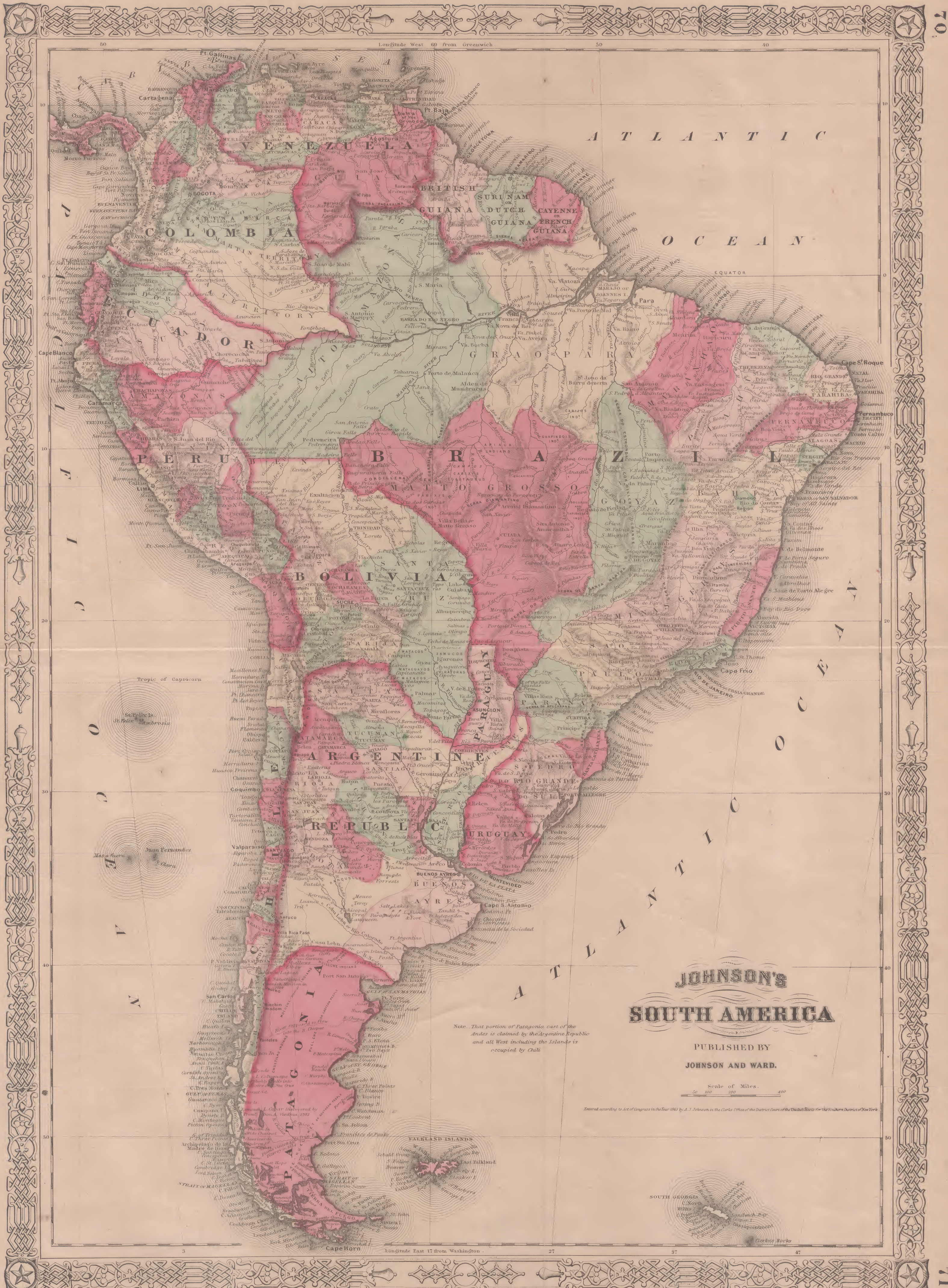


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11. Between the Amazon and La Plata no rivers of considerable size enter the Atlantic, except the Paranatyba and San Francisco. The latter runs in a longitudinal valley parallel to the mountains and the sea for the greatest part of its course, and then turning to the east and south-east falls into the ocean. The rest of the Brazilian streams that flow to the Atlantic present in their course and magnitude a striking resemblance to the Atlantic waters of the Alleghany system.

12. The lakes of South America are neither large nor numerous; and being in many cases caused by the overflowing of the immense rivers, they appear in the rainy season and are dry in the summer. The Lake of Maracaybo, into which the waters of the Gulf of Venezuela enter at high tides, is 120 miles long and 90 miles wide. The great fresh-water lake of Titicaca, situated in the Andes of Peru, 12,846 feet above the sea, has an area of 2,325 square miles, with a depth of more than 120 fathoms. The Desaguadero, which flows out of it, is partly lost by evaporation and infiltration, and terminates in the marsh or lake of Aullagas. Salt lakes and salt streams are occasionally found, especially on the pampas west of Buenos Ayres. There are also many lakes of small dimensions in Chili and parts of the Andes system. The lakes Mirim and dos Patos, on the south coast of Brazil are, like Maracaybo, rather arms of the sea than true lakes.

13. The plains of South America are variously designated as the "pampas" of La Plata, the "selvas" of the Amazon, and the "llanos" of the Orinoco.

a. The pampas occupy an area of upward of 800,000 square miles, and seldom rise to 1,000 feet above sea-level. Marked by their vegetation and other characteristics from east to west, they have been distinguished into four physical regions: the first, west from the coast, is covered with thistles and lucern of vivid green so long as the moisture from rain lasts; the second is covered with long grass intermixed with gaudy flowers; the third is a tract of swamps and bogs; and the fourth and last a border of thorny bushes and dwarf trees, reaching to the base of the Andes. The grassy plains of this level territory are occupied by thousands of wild cattle and horses.

b. The selvas of the Amazon lying in the centre of the continent are, as their name implies, covered with vast forests, and so densely as to prevent land travel. They extend for 1,500 miles along the river, and vary in breadth from 300 to 800 miles, and are inhabited solely by wild animals.

c. The llanos of the Orinoco occupy 150,000 square miles between the delta of that river and the Rio Coqueto, and are so perfectly flat as seldom to present an eminence of even a few feet in height. They are nearly destitute of trees; but after the rains they are clothed with fine grass and afford an abundant pasturage to the countless herds that roam over them. The dry season converts them into desolate wastes.

Besides these three great tracts of level country, there is the Desert of Patagonia, occupying nearly 200,000 square miles east of the Andes, and the most barren of all the plains of South America. For the most part it is occupied by sandy, sterile dunes, intermixed with stones and gravel, and occasionally diversified by huge boulders, tufts of brown grass, low and spiny bushes, brine lakes, saline incrustations, and basaltic platforms.

14. The geology of the southern division of America is known only in localities. It appears probable, however, that the base is entirely granitic, having gneiss here and there associated with it. Mica schist is the most common of the crystalline rocks. Quartz rock is also much developed, generally mixed with mica and rich in gold and specular iron. To the extent of 2,000 miles along the coast of Brazil granite is the prevailing rock, and with sienite forms the basis of the table-lands. The superstructure of the latter consists of metamorphic and old gneiss rocks, sandstone, clay-slate, limestone (in which are large caverns with bones of extinct animals), and alluvial soil. Porphyry and red sandstone abound all over the Andes. Peru, Bolivia, and Chili are the great mineral-producing countries, and yield chiefly silver, and in Chili copper. Gold is not found to any great extent in the Andine region nor yet in any other part of South America. The province of Minas Geraes, in Brazil, is also, as its name implies, rich in minerals. Brazil produces also a greater amount of diamonds than any other country. The great plains are wholly alluvial.

15. The climate of South America is greatly modified by local causes. The burning heats of the plains of Arabia are unknown on the Western Continent. In the steppes of Caracac, the hottest region of South America, the temperature of the day is only 98° in the shade, while it rises to 112° Fahr. in the sandy deserts of the Red Sea.

16. Throughout the whole basin of the Amazon, though under the equator, the climate is neither very hot nor very unhealthy. This arises from its being shaded by lofty forests and the prevalence of a cool easterly breeze, a branch of the trade winds, which ascends the channel of the Amazon, following all its windings nearly to the base of the Andes.

17. Brazil and the country extending west of it enjoys an equable and temperate climate, and even at Rio Janeiro the mean temperature is only 74° Fahr. Proceeding south the heat decreases; at Buenos Ayres the mean annual temperature is 63°, but in the Strait of Magellan the temperature of the warmest month does not exceed from 43° to 46°, while snow falls almost daily. The narrowness of the continent in this direction, the immense tracts of ocean which lie on either side of it, and its exposure to the rigors of the antarctic regions sufficiently account for this inclemency.

18. On the west coast, from latitude 7° to 32° south, there is a rainless district of nearly a thousand miles in length, the sea-vapors being condensed on the Andes. Within this region occurs the Desert of Atacama, the mining regions of Chili, and the guano islands of Peru.

19. The most distinguishing features in the vegetation of South America are its prodigious forests, which cover about two-thirds of the entire surface. These forests are in several remarkable particulars wholly different from those of the Eastern Continent. The trees are in greater variety, more graceful, and have more distinctive characteristics; and many of them, even the largest, are adorned with the most brilliant flowers.

20. Throughout the tropical region vegetation is on the grandest scale; and in those regions where there are due proportions of heat and moisture the magnitude of the trees and the splendor of the flowers are extraordinary. Fruits also abound, including oranges, limes, cocoa-nuts, pine-apples, mangoes, bananas, pomegranates, goyabas, etc., and many others which contribute to human sustenance or luxury.

21. Southward of the equator are found the bitter quassia, the fragrant tinga bean, the

beautiful rosewood, and the cinchona-tree. The latter is found chiefly on the Peruvian Andes.

22. The principal cultivated vegetables are—the indigo plant, sugar-cane, coffee plant, the cocoa-palm, and the cotton plant. The cultivation of the tea-tree has also been attempted in Brazil. Paraguay furnishes the yerba-maté, from which is prepared the universal beverage of one-half of the continent.

23. Farther southward, toward Patagonia, vegetation gradually loses its tropical character, and finally assumes a more and more stunted aspect, until it is lost in the mosses and lichens of the higher latitudes. A similar change from tropical to boreal is found by ascending the mountains until their bare and snow-covered heads alone point to the heavens.

24. The fauna of South America is in a great measure peculiar, and in its mammals particularly has no corresponding types in the other great divisions of the globe. A few species of carnivora and marsupials, indeed, such as the cougar and opossum, extend into the southern parts of North America; but the quadrumana, edentata, and pachydermata, without exception, and by far the greatest number of species belonging to other families, have never passed the Isthmus of Panama.

25. Of the wild animals, the quadrumana or American monkeys are not the least singular. They are entirely distinct from those of Asia and Africa, and compared with the apes and monkeys of these countries are certainly an inferior race. In no instance do they exhibit the close proximity to man which is observable in the orang-outang, chimpanzee, or gorilla. They are confined entirely to the tropical forests.

26. Of the winged mammals, the most remarkable are the vampires, which are of large size, and live upon blood sucked by them from men and animals when asleep. Happily these dreaded animals are not numerous, and are confined to the forests of Guayana and Brazil. No frugivorous bats exist in America.

27. The spectacled bear inhabits the Andes; but it is of smaller size and less carnivorous than the grizzly bear of the Rocky Mountains. The Jaguar of South America equals the Asiatic tiger in size and ferocity. The cougar or puma is found not only in South America, but in the southern part of North America. This animal is often, though improperly, called the American lion. Otherwise there are in South America a great variety of carnivorous animals, as wolves, foxes, lynxes, etc.

28. Though Australia appears to be the headquarters of the marsupials, there are in South America two genera—the opossums and yapachs. The first of these contains a great variety of species, all which, with the exception of the Virginia opossum, are confined to South America. The yapach—one of the most anomalous animals in existence—inhabits the rivers of Brazil and Guayana. These animals differ from the Australian marsupials in having prehensile tails and opposable hind-thumbs.

29. The rodents are represented in South America by the coypu (resembling the beaver, but non-constructive and not sociable), the chinchilla, cavies, porcupines, etc.

30. But of all mammals, the edentata are those which are most especially characteristic of American zoology. Five genera are peculiar to South America, and include the ai, sloth, armadillo, chlamphore, and ant-cater.

31. The elephant, hippopotamus, and rhinoceros have no existing types in America; and generally the pachyderms are poorly represented. Of the tapirs there are two species—the common tapir and one which inhabits the Andes. The peccary takes the place of the hog of other countries.

32. The only ruminant animals found in South America, exclusive of the llama and vicuña, are various species of deer. The llama and vicuña were used as beasts of burden by the Peruvians, and the long and thick fleece of the latter furnished a rich, fine wool, which was manufactured into a cloth of beautiful texture.

33. The horse, the ass, the ox, the sheep, the goat, and the pig are all strangers to the New World. These, however, are now found in all parts, in the service of civilization or in a wild state, roaming over the pampas and plains of the vast interior.

34. The birds of America are remarkable for their varied and splendid coloring. Rapacious birds are of a great many different species, as well of vultures as of owls, hawks, and eagles. The condor of the Andes is the largest bird of prey known. Macaws, parrots, and parakeets swarm in all the forests. The gallinaceous tribe is represented by turkeys, curassows, and guans, all of which, with the exception of the Virginian turkey, are peculiar. The humming-bird, of which there are more than two hundred species, is found most abundantly in the tropical forests, but extends its range forty degrees on either side of the equator.

35. The American ostrich is much smaller than the African species. It is found principally on the pampas from the Amazon to the Strait of Magellan. Of wading birds, the scarlet ibis and the American flamingo are the most remarkable. Swimming birds are very numerous, whether in variety or individuals, but have no distinguishing characteristics.

36. Among reptiles, the principal are the turtle, the alligator, agama, and iguana. The alligator supplies the place of the crocodile, and the agama that of the chameleon of the Eastern Continent. Among the serpents, the genus boa is peculiar to America; it contains many species, the principal of which are the boa constrictor, anaconda, and aboma, which inhabit the swamps of the tropics.

37. The aboriginal races of man are the same throughout America—from Behring's Strait to Cape Horn. They are almost all of a reddish or copper color, with long black hair, deep-set and black eyes, aquiline nose, and often of handsome slender forms. In South America many are half-civilized, but a greater number are still in a state of utter barbarism. The aboriginal population of Chili, known as the Araucanos, are more advanced in civilization than the Indians of the plains, have fixed residences, and subsist chiefly on the products of labor. The same fact is presented throughout all the Andine regions, and before their conquest by the Spaniards several great nations were in existence, and had built great cities and opened the country to commerce by constructing roads. The Indians of the plains, since the introduction of the horse, live mostly in the saddle and lead the roving life of hunters, neither cultivating the ground nor applying themselves to any other kind of labor. Of the Brazilian Indians there are said to have been no less than two hundred distinct tribes, and many of these were cannibals and extremely ferocious. Those along the coast are allied to the Caribs.

## GEOGRAPHY OF SOUTH AMERICA.



1. SOUTH AMERICA occupies a much more eastern position than the northern section of the continent, and is separated therefrom by the Caribbean Sea and the Gulf of Mexico—the connection of the two parts being maintained only by the narrow Isthmus of Panama. It lies between 12° 30' north and 56° 20' south lat., and 34° 40' and 81° 45' west longitude, and measures north and south 4,800 miles, and east and west, in its greatest breadth (in lat. 6° south), 3,200 miles. The area is estimated at 7,061,000 square miles.

2. The continent has the form of an irregular triangle, of which the three points are—the Isthmus of Panama (lat. 8° 30' north, and long. 77° 30' west), Cape San Roque (lat. 5° 30' south, and long. 35° 30' west), and Cape Horn (lat. 56° 30' south, and long. 67° 30' west). Its peninsular form presupposes a vast extent of coast, and in this as well as in the absence of great indentations of the ocean, it presents some resemblance to Africa. The extent of coast that it offers to the Caribbean Sea and Atlantic Ocean is roughly estimated at 10,000 miles, and to the Pacific at 5,800 miles.

3. Tierra del Fuego, though separated from the mainland by a narrow arm of the sea—the Strait of Magellan—must be considered, with its barren islands and rocks, as the termination of the continent. From this point, advancing northward along the coast of the Pacific, we find it studded with almost innumerable islands, some of considerable extent, separated by countless channels. This island coast extends as far north as the Chiloe Archipelago. Through all this distance the mountains press close on the shore, and the sea, insinuating itself within them, detaches island masses and makes many deep creeks, somewhat resembling the fiords on the coast of Norway. The coast north of the 40th parallel presents no features that require notice in this general sketch, except the great bend that takes place about the latitude of Lake Titicaca, corresponding to a change in the direction of the Andes, and north of its most western extension the Gulf of Guayaquil and the Bay of Panama.

4. The Atlantic coast, though maintaining remarkable uniformity, presents in its southern division several gulfs of considerable size and the great estuary of La Plata; and in its north-eastern division the estuary of the Amazon and the delta of the Orinoco. The Caribbean coast is more irregular and indented by more numerous, if less extensive, encroachments of the sea. It is here we find the Gulf of Darien, that of Venezuela, and the Gulf of Paria, and between the islands of Aruba and Margarita the scoop inland is of great extent.

5. The Andes—the great mountain-system of South America—presents the longest unbroken range of lofty summits on the globe. This great mountain chain constitutes the

axis of this part of the continent, and approaches the western shore much nearer than the line of the Rocky Mountains in North America. The consequence is, that while North America possesses an extensive water-system on the Pacific slope, no considerable stream from the Andes enters the western ocean.

6. These mountains, though stretching through a length of 4,400 miles, are of inconsiderable width, but as regards elevation are second only to the Himalaya Mountains of Asia. In their southern part, as before related, they form a group of mountain islands, constituting the archipelago of Tierra del Fuego, and are penetrated in every direction by narrow inlets of the sea, ending often in glaciers formed from the snow on their summits, here frequently 6,000 feet high. North of these insular mountains the line is frequently divided by wide, longitudinal valleys, presenting lofty walls on either side, and in parts forming two or more separate ranges, and in its course is cut by several remarkable mountain passes. Many of the peaks are volcanoes, varying in height from 13,000 to 22,000 feet. In the Isthmus of Panama the Andes are depressed and there terminate.

From both sides of the chain branches are thrown off and the slopes are rugged and hilly, being most precipitate toward the Pacific, the distance from which is seldom more than a hundred to two hundred miles.

7. Besides the offsets that shoot out from the Andes, we find in South America several distinct mountain-systems. That which runs along the coast of Venezuela is, however, an offset from the eastern Cordillera, which runs down to the Caribbean Sea along the east side of the Lake of Maracaybo. From this system the Venezuelan chain strikes off at right angle, in two parallel ranges running due east, of which the northern keeps close to the sea, culminating in the Silla de Caracas and terminating in the island of Trinidad. In consequence of this conformation of the northern coast, no great rivers enter the sea between the mouth of the Magdalena and that of the Orinoco. The Magdalena itself rises in the Andes, at a point where the mountains divide, and runs in a longitudinal valley through nine degrees of latitude to the Caribbean Sea.

8. The highland of Guayana or Parimé lies between the lower waters of the Orinoco and the Amazon, and forms, with the high table-land of Venezuela and the Andes, the boundary of that immense plain which is drained by the Orinoco. This mountain-system runs from east to west perhaps 600 miles, and consists of several parallel chains, some of which rise to the height of 4,000 to 5,000 feet, and Mount Roraima even to 7,500 feet. Numerous streams descend these mountains to the ocean, the largest of which, the Essequibo, runs through almost impervious tropical forests and enters the sea in about 7° north latitude. The culminating point of the system, however, is Maravaca, situated in its western part, a little to the north of that remarkable natural canal—the Casiquiare—and attains the height of 10,500 feet.

9. The highlands of Brazil lie on the east side of the continent between the Amazon and La Plata. In their position and their relation to the great basins of the continent, they present a most striking analogy to the Alleghany system of North America. Between the Andes and the highlands of Brazil lies the extensive plain drained by the constituents of the Plata, and between the mountains of Guayana and those of Brazil lies spread the immense level that belongs to the lower course of the Amazon.

10. The main mass of the Brazil system lies between 18° and 25° north latitude, and consists of several ranges, with a length of about 700 miles and a breadth of 400 miles. The range nearest the sea is called the Serro do Mar; next to this and adjoining on to the Serro do Mar, in about lat. 22° 30' south, we find the central chain, which running as far north as the 10th parallel south, contains the highest points of the system. This chain is called the Serro Espinhaço, and in its northern part the Serro Mantiqueira, which contains Juruaça, the highest point of the system, rising to 8,400 feet. The western chain, which is of small elevation, separates the affluents of the Parana and San Francisco from those of the Araguay and Tocantins. It does not appear that any mountain-system connects the highlands of Brazil with the Andes; and consequently the waters of the Paraguay are separated from the southern tributaries of the Amazon by a watershed of no great elevation. In no part of the world, indeed, do we find such river basins as those of the Orinoco, the Amazon, and the Plata separated by such slight elevations. The small difference between the levels of the upper courses of the Orinoco and Amazon is shown by the Casiquiare, the canal which connects the two systems; and from the basin of the Amazon to that of the Plata the ascent is not greater than from the upper Mississippi to the level of the great lakes of North America.